

**Amendments to the Drawings:**

The attached sheet of drawings includes new Figures 6a and 6b. No new matter is believed to have been added with the addition of these figures. The addition of Figures 6a and 6b is discussed in the Remarks section.

Attachments: replacement sheet

### **Remarks**

Claims 1-5 and 8-40 are pending the application, of which claims 1 and 2 are in independent form. Claim 15 is cancelled. Claims 1-5, 8, 10, 11, 13-14, 18-21, 24-27, 29, 33-36, and 39-40 are amended herein. All pending claims stand rejected in the Office Action mailed May 18, 2007 (the Office Action). Reconsideration of the pending claims in light of these amendments and remarks is respectfully requested. For the Examiner's convenience, this response addresses the Office Action's objections in the same order they were raised.

### **Objections to the Specification**

The Office Action objects to the drawings under 37 C.F.R. § 183(a) as purportedly failing to show every feature of the invention specified in the claims. Applicants have addressed this objection by adding Figures 6a and 6b. In addition, Applicants have submitted a replacement specification to describe Figures 6a and 6b. Applicants believe that these additions have not added any new matter to the specification.

The Office Action objects to the claim for priority in the specification as filed since it appears that no such claim was made when the Application was filed. Applicants have removed the claim of priority from the replacement specification.

The Office Action objects to the abstract and the format of the specification headings. These informalities have been addressed in the replacement specification.

Due the extensive changes required to address the addition of Figures 6a and 6b and other informalities, Applicants have attached a replacement specification. Pursuant to 17 C.F.R. § 1.121, Applicants have included a replacement specification both in marked-up and clean form. Applicants believe that no new matter has been added in the replacement specification.

### **Objections to the Drawings**

The Office Action objects to the drawings under 37 C.F.R. § 1.83(a) as now showing every feature of the invention as specified in the claims. Specifically, the Office Action contends that a recited "computer system" and method steps are not shown in the Figures. Accordingly, Applicants have amended the figures to add Figures 6a and 6b.

Applicants believe that the addition of these figures has not caused any matter to be added to the disclosure. The disclosure as filed teaches a recited “computer system” having machine readable instructions, “[t]he method of the present invention is carried out by being programmed in machine readable [instructions], such as is common with computer software, and implemented to act on a computer system.” Paragraph [0075]. In addition, the disclosure as filed teaches obtaining a plurality of waveform signals [0069], individualizing univariate and bivariate features, weighing the features, and determining a probability of a received waveform signal [0050-0064]. As such, Figures 6a and 6b and new specification paragraphs [0076-0092] are supported by the application as filed and, as such, do not add any new matter.

#### Objection to Priority Claim

As discussed above, Applicants have removed the claim of priority from the specification. Applicants do not pursue a claim for priority to the United States Provisional Application filed June 8, 2000, entitled “METHOD AND APPARATUS FOR HISTOLOGICAL AND PHYSIOLOGICAL BIOMETRIC OPERATION AND AUTHENTICATION” at this time.

#### Claim Objections

The Office Action objects to Claims 8, 10-11, 14, 19-21, 26-27, 34-26 and 40 because of purported informalities in the claims. Each of these informalities is addressed in turn.

The Office Action objects to Claims 8, 14, and 40 as having awkward language and/or lacking antecedent basis. These claims have been amended herein as suggested by the Examiner.

The Office Action objects to Claims 10, 11, 19-21, 26, 27, and 34-36 as purportedly having informalities, specifically, that several claim terms lack antecedent basis. Applicants have amended claims 10 and 26 herein to address these purported informalities.

#### Claim Rejections – Claims 8, 14, and 40 under 35 U.S.C. § 112 ¶ 1

Claims 8, 14, and 40 stand rejected in the Office Action has allegedly failing to comply with the written description requirement. The Office Action states that the claims contain subject matter that was not adequately described in the specification in such a way as

to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention at the time the application was filed. Specifically, the Office Action purports that there is insufficient basis for the steps of, “measuring an additional pre-selected heartbeat waveform feature to generate a corresponding additional measurement and preventing the weighing of the additional pre-selected heartbeat waveform feature in statistical analysis.”

The specification as filed adequately describes the subject matter of these Claims 8, 14, and 40. With respect to the claim features objected to in the Office Action, the disclosure teaches measuring various heartbeat waveform features (25 listed in Table 1) that may be used to represent, “different unique feature[s] for a particular person’s heartbeat waveform.” Paragraph [0046]; also see Table 1. The disclosure goes on to teach a method and system for determining which measured waveform features may be used to “individualize” the waveform; specifically, the disclosure teaches applying statistical analysis to the waveform feature measurements to determine which are suitable for individualization, “[w]hen there is little fluctuation or variation in a measured feature of the waveforms, the feature is relatively consistent and may be a good authenticating feature ... [i]f there is significant variation in the waveform, the standard deviation is high.” Paragraph [0050]. The disclosure teaches that a user may be authenticated by determining the statistical, “likelihood or probability that a particular biometric waveform was generated by the authenticated user.” Paragraph [0069]. The disclosure further teaches that some measured waveform features may be removed from the statistical authentication analysis: “features which are not helpful in the individualization process are thereafter not determined or measured during any subsequent authentication procedures for that user ... [i]n another embodiment, the features are determined and measured but are not included in calculations or analysis of subsequent waveforms for authentication.” Paragraph [0071]; emphasis added. As such, the disclosure as filed teaches measuring an additional pre-selected heartbeat waveform feature and then preventing the weighing of the additional pre-selected heartbeat waveform feature in the statistical analysis as recited in Claims 8, 14, and 40.

Claim Rejections – Claims 2-5 13-14, 25-40 under 35 U.S.C. § 112 ¶ 2

Claims 2-5, 13-14, and 25-40 stand rejected as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter Applicants regard as the invention as required by 35 U.S.C. §112 ¶ 2. Each of the claim rejections is addressed in turn.

The Office Action rejects Claim 2 as allegedly omitting an element, specifically, “a set of instructions for carrying out the method executed by the computer system.” Claims 3-5 and 25-40 depend from Claim 2 and stand rejected in the Office under the same grounds as Claim 2. Claim 2 has been amended herein to recite address the purported deficiency. Claim 2 now recites, “[a] computer readable storage medium containing instructions for controlling a computer system to perform a method to individualize a heartbeat electronic signal for use in biometric authentication, the method comprising....” Accordingly, Applicants respectfully traverse the rejection of Claim 2 and of depending claims 3-5 and 25-40.

The Office Action rejects claims 3-5 as having insufficient antecedent basis for the limitation of “variable/variables per observation.” Specifically, the Office Action objects to the term “observation” as the Examiner is unsure of what meaning should be ascribed to it. Applicants have amended Claims 3-5 herein to recite “...where said measurements are made on ... variable[s] per acquisition.” Acquiring a plurality of electronic heartbeat signals is recited in independent Claim 2 from which each of Claims 3-5 depend. Accordingly, Applicants respectfully traverse the rejection of Claims 3-5 under 35 U.S.C. § 112 ¶ 2.

Claims 13 and 29 stand rejected in the Office Action under 35 U.S.C. § 112 ¶ 2. The Office Action purports that there is insufficient antecedent basis for reciting, “...the average from each corresponding measurement ...” in each claim since the Examiner is unsure whether the recited measurements are averaged together or whether the plurality of measurements for each particular feature is averaged together. Claims 13 and 29 have been amended herein to more clearly recite the claimed subject matter. Claims 13 and 29 as amended herein recite, “...calculating an average for each of said pre-selected heartbeat waveform feature from said measurements...” The term “measurements” as used in Claims 13 and 29 has an antecedent basis in independent Claim 1 and 2, “...for each electronic heartbeat signal, measuring a plurality of pre-selected heartbeat waveform features to generate corresponding measurements...” emphasis added. Accordingly, Applicants respectfully traverse the rejection of Claims 13 and 29 under 35 U.S.C. § 112 ¶ 2.

Claim Rejections – Claims 1-5 and 8-40 under 35 U.S.C. § 101

The Office Action rejects claims 1-5 and 8-40 as allegedly being directed to non-statutory subject matter. Specifically, the Office Action purports that the claims are directed to abstract ideas, rather than practical applications of those ideas. Claims 1 and 2 have been amended herein to recite, “authenticating a user using said weighed pre-selected heartbeat waveform features.” This recited feature represents a tangible, useful and concrete method step wherein the “weighting” is employed to authenticate a user. As such, Applicants respectfully traverse the rejection of independent Claims 1, 2 and depending claims 2-5 and 8-40 under 35 U.S.C. § 101.

Claim Rejections – Claims 1-5, 16-17, 22-24, 31,32 and 37-39 under 35 U.S.C. § 102

Office Action rejects Claims 1-5, 16-17, 22-24, 31,32 and 37-39 under 35 U.S.C. § 102(b,e) as being allegedly anticipated by U.S. Pat. No. 4,742,458 to Nathans (“Nathans”). A claim may be rejected under § 102, “only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference.” Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628 (Fed. Cir. 1987); emphasis added; also see MPEP § 2131. Since Nathans does not teach or suggest at least one of the elements of the rejected claims, Applicants respectfully traverse this rejection.

Nathans does not teach or suggest, “weighing the pre-selected heartbeat waveform features to provide a different statistical weight for each pre-selected heartbeat waveform feature...” The Office Action purports that Nathan Fig 2., 4-7 and cols. 10-16 teach this feature. However, these sections of Nathans deal with how various heartbeat waveform features are detected, not how they are weighed as recited in the claims. For example, Nathans discusses determining a “threshold value” which is used to, “detect the start of the pattern for pattern detection purposes.” Nathans col. 10-14 discusses how various features of the heartbeat waveform are detected (e.g., slope transitions [col. 10 ll. 61-68]). In fact, Nathans states that the “signature” of a particular heartbeat wave pattern is the intervals between the slope transitions. Nathans col. 11 ll. 10-15. While detecting such transitions may be considered measuring a heartbeat waveform, it is not “weighing [a] pre-selected heartbeat waveform feature[] to provide a different statistical weight for each pre-selected heartbeat



waveform feature” as recited in Claims 1 and 2. While Nathans does discuss using a “proximity” threshold when making a comparison between a particular waveform and a pre-stored “bin,” such a probability is applied to the entire matching process, and, since the “threshold” is applied across the entire comparison, each “weight” would necessarily be the same across all waveform features. See Nathans col. 14 l. 60- col. 15 l. 4.

In contrast, Claims 1 and 2 recite, “measuring, a plurality of pre-selected heartbeat waveform features ... [and] weighing the pre-selected heartbeat waveform features to provide a different statistical weight for each pre-selected heartbeat waveform feature.” Nathans does not teach or suggest weighing pre-selected features or applying a different statistical weight to each feature. Since Nathans fails to teach or suggest at least one of the features of Claims 1 and 2, Applicants respectfully traverse the rejection of these claims.

Moreover, and in addition to the above, Nathans does not teach or suggest, “authenticating a user using weighted pre-selected heartbeat waveform features” as recited in Claims 1 and 2. emphasis added. As such, Applicants respectfully traverse the rejection of these claims. Dependent Claims 3-5, 16-17, 22-24, 31-32, and 37-39 incorporate all of the features of their respective independent Claims 1 and 2. As such, Applicants respectfully traverse the rejection of these claims.

#### Claim Rejections – Claims 1-5, 15-23 and 30-38 under 35 U.S.C. § 102(e)

The Office Action rejects Claims 1-5, 15-23, and 30-38 under 35 U.S.C. § 102(e) as being allegedly anticipated by U.S. Pat. App. 2002/0138768 to Murakami (“Murakami ‘768”). Notwithstanding the purported teachings of Murakami ‘768, Applicants respectfully traverse these rejection since any invention disclosed but not claimed in Murakami ‘768 was derived from a common inventive entity of this application and, as such, is not the invention “by another” as required by § 102(e). Despite the fact that the present invention has one additional inventor from Murakami ‘768, the Federal Circuit has held that, in traversing a rejection under 35 U.S.C. § 102(e), “[w]hat is significant is not merely the differences in the listed inventors, but whether the portions of the reference relied on as prior art, and the subject matter of the claims in question, represent the work of a common inventive entity.”

Riverwood Int’l Corp. v. R.A. Jones & Co., 324 F.3d 1346 at 1356 (Fed. Cir. 2003).

Accordingly, Applicants have attached an affidavit pursuant to 37 C.F.R. § 1.131 from Clark

Hinton stating that the portions of Murakami '768 relied upon in the Office Action were derived from inventors of this application and, as such, are not the invention "by another." Since Murakami '768 does not qualify as a prior art reference under 102, Applicants respectfully traverse the rejection of Claims 1-5, 15-23, and 30-38.

#### Claim Rejections – Claims 1-5, 15-23, and 30-38 Under Double Patenting

Claims 1-5, 15-23, and 30-38 were rejected on the ground of provisional nonstatutory obviousness-type double patenting as being unpatentable over copending Application No. 09/814,607. In response to the double patenting rejections, Applicant submits a terminal disclaimer herewith. Withdrawal of this rejection is respectfully requested.

#### General Considerations


By the remarks provided herein, Applicant has addressed all outstanding issues presented in the Office Action. Applicant notes that the remarks presented herein have been made merely to clarify the claimed invention from elements purported by the Office Action to be taught by the cited references. Such remarks should not be construed as acquiescence, on the part of Applicant, as to the purported teachings or prior art status of the cited references, nor as to the characterization of the cited references advanced in the Office Action. Accordingly, Applicant reserves the right to challenge the purported teachings and prior art status of the cited references at an appropriate time.



**Conclusion**

For the reasons discussed above, Applicant submits that the claims are in proper condition for allowance, and a Notice of Allowance is respectfully requested. If the Examiner notes any further matters that may be resolved by a telephone interview, the Examiner is encouraged to contact John Thompson by telephone at (801) 578-6994.

Respectfully submitted,

By   
John R. Thompson  
Registration No. 40,842

STOEL RIVES LLP  
One Utah Center Suite 1100  
201 S Main Street  
Salt Lake City, UT 84111-4904  
Telephone: (801) 328-3131  
Facsimile: (801) 578-6999